

**AMENDMENTS TO THE SPECIFICATION**

**Please amend the title of the application as follows:**

~~BUTADIENE-BASED POLYMER AND PROCESS FOR METHOD OF PRODUCING THE SAME~~~~[, AND]]~~ AS WELL AS RUBBER COMPOSITION AND TIRE COMPRISING OR MADE FROM USING THE SAME

**Please amend paragraph [0003] as follows:**

[0003] Also, a composite catalyst system comprising a rare earth metal compound and an organometallic compound of [[Group]] Groups I-III is developed as a catalyst capable of producing the butadiene-based polymer with a high cis-1,4 bond content and having an excellent polymerization activity. For example, it is known that when using a catalyst system comprising a neodymium compound and ~~methylalunioxane~~, methylaluminoxane the polymerization can be conducted in a high reactivity and a conjugated diene polymer having a narrow molecular weight distribution is obtained. However, the polymer obtained by this method is not sufficiently high in the cis-1,4 bond content and also a vinyl bond content is not sufficiently low, so that the properties are still insufficient.

**Please amend paragraph [0004] as follows:**

[0004] JP-A-2001-48940 discloses that the butadiene-based polymer having a very high cis-1,4 bond content is obtained by polymerizing butadiene in a catalyst system comprising a rare earth metal compound, an organometallic compound of [[Group]] Groups I-III and an ionic

compound consisting of a non-coordinate anion and cation. In this case, however, there are problems that a special compound such as  $\text{Nd}(\text{OCOC}\text{Cl}_3)_3$  or the like is used as a rare earth metal compound and this compound has a low polymerization activity. Also, since NMR is utilized as a measurement of the micro-structure in JP-A-2001-48940, the error of the vinyl bond content is particularly large and further the value of the vinyl bond content in the resulting butadiene polymer is large, so that the rubber composition containing such a butadiene-based polymer is insufficient in the improvement of the properties as compared with the rubber composition containing the conventional butadiene polymer. Furthermore, the butadiene-based polymer obtained by this method tends to widen the molecular weight distribution as the vinyl bond content becomes low, so that there can not be obtained butadiene-based polymers in which the vinyl bond content is sufficiently low and the molecular weight distribution is within a specified range.

Please amend paragraph as follows:

[0006] In Aida, Hou, Nishiura, Doi, Kurakado, Horiuchi and Wakatsuki, Macromol. Rapid Commun. 2003, vol. 24, ~~pp179-184~~ pp. 179-184, is disclosed that the polybutadiene-based polymer having a very high cis-1,4 bond content is obtained by polymerizing butadiene in a catalyst system comprising a metallocene complex of a gadolinium compound. In this case, however, there are problems that the molecular weight distribution of the polymer having a high cis-1,4 bond content is very low of not more than 1.5 and the rubber composition containing such a polymer is low in the workability and difficult in the milling and can not develop the excellent

properties. Also, the butadiene-based polymer having a very high cis-1,4 bond content obtained by this method is too high in the molecular weight and has a problem that the workability is very poor in the usual rubber working machine. Further, means for controlling the molecular weight is not disclosed in the above Aida et al report, so that the practicality is low.

**Please amend paragraph [0010] as follows:**

[0010] <Analysis of micro-structures through FT-IR([ )]>

**Please amend paragraph [0027] as follows:**

[0027] As the other ~~monomer~~ monomers capable of copolymerizing with 1,3-butadiene are mentioned, for example, a conjugated diene monomer having a carbon number of 5-8, an aromatic vinyl monomer and the like. Among them, the conjugated diene monomer having a carbon number of 5-8 is preferable. As the conjugated diene ~~monomer~~ monomers having a carbon number of 5-8 are mentioned 2-methyl-1,3-butadiene, 2,3-dimethyl-1,3-butadiene, 1,3-pentadiene, 1,3-hexadiene and the like. As the aromatic vinyl ~~monomer~~ monomers are mentioned styrene, p-methylstyrene,  $\alpha$ -methylstyrene, vinylnaphthalene and the like.

**Please amend paragraph [0043] as follows:**

[0043] The Lewis base is reacted at a ratio of 0.01-30 mol, preferably 0.5-10 mol per 1 mol of the metal halogen compound. By using the reaction product with the Lewis base, metal remaining in the polymer can be decreased ~~metal remaining in the polymer~~.

**Please amend paragraph [0044] as follows:**

**[0044]** As the organic ~~compound~~ compounds containing the active halogen are mentioned  
benzyl chloride and the like.